UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,290	07/27/2001	Kwok-Shun Cheng	MCA-437PC/US	8923

7590 07/07/2005

Mykrolis Corporation
129 Concord Road
Billerica, MA 01821-4600

EXAMINER	
MENON, KRISHNAN S	

ART UNIT	PAPER NUMBER
1723	

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/890,290	CHENG ET AL.	
	Examiner	Art Unit	
	Krishnan S. Menon	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *33-64* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *33-64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 33-64 are pending in the RCE of 5/23/05

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 33-64 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Independent claims 33, 41,55 and 64 recite "... said resin formed by thermally induced phase separation, ...". There is no disclosure to support this limitation in the specification or claims as originally filed. While there may be support for 'membrane' formed by thermally induced phase separation; there is no support for the 'resin' formed by thermally induced phase separation.

Claim 55 at indent (b) recites a "cylindrical perfluorinated thermoplastic polymer membrane filter formed by thermally induced phase separation and liquid-liquid phase separation arrangement having a generally annular form ...". This limitation also has no support in the specification or claims as originally filed.

Claim 55-63 are also rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The limitation "cylindrical perfluorinated thermoplastic polymer membrane filter formed by thermally induced phase separation and liquid-liquid phase separation arrangement having a generally annular form ..." is also not enabling because there is no description in the specification as originally filed for one of ordinary skill in the art to make this cylindrical filter in annular form by *thermally induced phase separation and liquid-liquid phase separation arrangement*. It is unclear what is made by the recited process. For examination purpose, Examiner assumes that it is the membrane that is formed by the thermally induced and liquid-liquid phase separation.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 33,34,36, 39, 40 (depending from 33,34,36 or 39), and 41-43 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Muto et al (US 5,066,397).

Claim 33, 41: Muto teaches a perfluorinated thermoplastic resin filter cartridge comprising a housing having an inlet and an outlet (figure 5) and one or more membrane filters (1) between the inlet and the outlet, sealing means (2) forming a liquid-tight seal, integral filter (col 13 line 67 – col 14 line 21, figure 5), fluid must pass through one or more membrane filters from inlet to outside (see fig 5 and also col 14 lines 33-45 – hollow fibers with one end sealed). The seal and the membrane are of PFA, HFP etc., as claimed (col 4 lines 36-45 and col 6 lines 27-33), with melting point of sealing means equal to or less than that of the membrane filter resin. Membrane is a hollow fiber – abstract.

Muto does not teach the resin for the membrane or the sealing means as being made of thermally induced phase separation. However, this would be a process limitation for making the resin, and would not affect the product, i.e., the filter. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

Claims 34, 36, 39, 42: the filter has two surfaces with a porous wall in between – hollow fiber membrane is so formed (see abstract and figures). Fibers are open at both ends for fluid flow (see figures)

Claim 40, 43: Material of membrane and sealing compound is PFA or FEP - col 4 lines 36-45 and col 6 lines 27-33.

2. Claims 33,34,35,37,40(depending from 35 or 37), 45-51, and 55-63 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ashelin et al (US 5,154,827).

Claim 33: Ashelin teaches an all perfluorinated thermoplastic resin filter cartridge comprising a housing (of thermoplastic perflourinated resin) having an inlet and an outlet (figures) and one or more membrane filters between the inlet and the outlet, sealing means (col 4 lines 43-48) forming a liquid-tight seal, integral filter (col 4 lines 43-48), fluid must pass through one or more membrane filters from inlet to outside (see figures). The entire filter is of PFA (col 4 lines 39-42), with melting point of sealing means equal to or less than that of the membrane filter resin.

Ashelin does not teach the resin for the membrane or the sealing means as being made of thermally induced phase separation. However, this would be a process limitation for making the resin, and would not affect the product, i.e., the filter. In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

Claims 34, 35,37 and 40: the filter has two surfaces with a porous wall in between – flat sheet (see abstract and figures). Pleated filter (see figures); material of membrane and sealing compound is PFA - col 4 lines 39-42.

Claims 45-51 and 55-63: Ashelin teaches an all thermoplastic fluoropolymer filter as detailed in claim 33 above, with the preferred polymer being PFA. The membrane

formed by thermally induced and liquid-liquid phase separation – product by process limitation; in re Thorpe.

The membrane is fibrillated (see col 6 lines 59-64: membrane made by any method, which includes the fibrillated). Also the membrane of the preferred construction is described as superior to the conventional stretched filters interconnected by fibrils – col 9 lines 1-5. "Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments" (In re *Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971)). A reference is no less anticipatory if, after disclosing the invention, the reference then disparages it. The question whether a reference "teaches away" from the invention is inapplicable to an anticipation analysis. *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998).

Filter is microporus or ultrafilter – see pore sizes that agree with applicant's disclosure – abstract. End caps are tightly joined and unitary – col 4 lines 43-48. PFA preferred – col 4 line 40.

Alkyl in PFA would be methyl or propyl – a generic chemical formula will anticipate a claimed species covered by the formula when the species can be at once envisaged from the formula: Ex parte A, 17 USPQ2d 1716 (Bd. Pat. App. & Inter. 1990). If one of ordinary skill in the art is able to "at once envisage" the specific compound within the generic chemical formula, the compound is anticipated. One of ordinary skill in the art must be able to draw the structural formula or write the name of each of the compounds included in the generic formula before any of the compounds

can be "at once envisaged." One may look to the preferred embodiments to determine which compounds can be anticipated. In re Petering, 301 F.2d 676, 133 USPQ 275 (CCPA 1962). Also, such PFA is commercially available.

Pleated with fabric support as in claim 56 and 57 (col 9 lines 32-43).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 44 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muto et al (US 5,066,397) in view of Ashlin-827.

Claim 64: Muto teaches a perfluorinated thermoplastic resin filter cartridge comprising a housing having an inlet and an outlet (figure 5) and one or more membrane filters (1) between the inlet and the outlet, sealing means (2) forming a liquid-tight seal, integral filter (col 13 line 67 – col 14 line 21, figure 5), fluid must pass through one or more membrane filters from inlet to outside (see fig 5 and also col 14 lines 33-45 – hollow fibers with one end sealed). The seal and the membrane are of PFA, HFP etc., as claimed (col 4 lines 36-45 and col 6 lines 27-33), with melting point of sealing means equal to or less than that of the membrane filter resin. Membrane is a hollow fiber – abstract.

Muto does not teach the membrane or the resin for the membrane or the sealing means as being made of thermally induced phase separation and/or liquid-liquid phase separation. However, this would be a process limitation for making the resin, and would not affect the product, i.e., the filter. In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Muto also does not specifically teach the housing and housing ends as made of thermoplastic perfluorinated polymer. Ashelin teaches making the entire filter with thermoplastic polymer with PFA as the preferred polymer – col 4 lines 30-42. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Ashelin in the teaching of Muto to have the entire filter module made of PFA because of the advantages of PFA such as the most inert with the highest temperature use with still being melt-processable as taught by Ashelin.

Claims 44 differs from the teaching of Muto in that Muto does not specifically teach the end cap as of perfluorinated thermoplastic polymer. Ashelin teaches making the entire filter with thermoplastic polymer with PFA as the preferred polymer – col 4 lines 30-42. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Ashelin in the teaching of Muto to have the entire filter module made of PFA because of the advantages of PFA such as the most inert with the highest temperature use with still being melt-processable as taught by Ashelin.

4. Claims 33-37, 39, 40(depending from 33-37 or 39), and 41-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai (680) in view of EP 0 175 432 A2

Kawai (680) teaches a filtration cartridge with a housing having an inlet and outlet with one or more membranes located inside, having a liquid-seal and the membrane formed of perfluorinated thermoplastic resin (fig 22,23, col 9 lines 15-62) as in independent claims 33,41,45,55 and 64.

Note: In column 3 lines 43-52, Kawai defines PTFE as tetrafluoroethylene homopolymer or a copolymer ..., eg., as PFA or FEP. Thus the PTFE of Kawai is polytetrafluoroethylene, PFA or FEP, and thus anticipates the claim limitation of the "thermoplastic fluoropolymer".

Kawai teaches phase separation for forming the membrane (col 5 lines 24-68), but does not teach the membrane as formed of thermally induced phase separation and liquid-liquid phase separation, and that the resin is made of thermally induced phase separation. However, "thermally induced phase separation" and "liquid-liquid phase separation" are process steps in product claims, which are unpatentable: In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

Kawai does not teach the housing with inlet and outlet for the module as claimed. However, this would be inherent, because a module requires a housing having inlet and outlet for making it usable. EP teaches an all – perfluoro thermoplastic filter module including housing and end-caps. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of EP-432 in the teaching of Kawai to have an all thermoplastic module including housing and end caps for the thermal and chemical resistance such a construction affords as taught by EP-432 (abstract, pages 1 and 3).

Re the additional limitations and dependent claims: The Kawai ref teaches that the membrane could be flat sheet, pleated, hollow fiber or spiral, (col 9 lines 45-55; col 10 lines 57-64 – flat sheet). The membrane is potted in, and the caps could be of, a thermoplastic perfluorinated resin (example 6, col 3 lines 44-52). The cartridge made substantially of thermoplastic perfluorinated resin (example 6, col 9 lines 15-62, col 3 lines 44-53). The membrane could be microporous or ultrafiltration (col 7 lines 8-55, col 10 lines 1-19, examples). The thermoplastic fluorinated polymer is PFA or FEP. The seal material for the cartridge has a lower melting point than the membrane material (col 8 lines 6-41). The cartridge is cylindrical and could have a cylindrical (tubular) membrane in an annular form (one tubular membrane in one housing) (col 9 lines 44-58) and of substantially perfluorinated thermoplastic (col 3 lines 44-52). Kawai (680) teaches a hollow fiber cartridge with parts made substantially of perfluorinated thermoplastic (col 3 lines 44-52, fig 23, col 9 lines 15-62) with two ends having liquid-tight seals. Fibrillated – see figures 1,2,6,9 and 13 of Kawai which resemble the fibrils as defined by the applicant (in the response filed by applicant on 11/3/03 and figure 7 of WO/004484).

Kawai (680) does not teach the specific alkyl group in claims 61 and 63. However, a generic chemical formula will anticipate a claimed species covered by the formula when the species can be at once envisaged from the formula: Ex parte A, 17 USPQ2d 1716 (Bd. Pat. App. & Inter. 1990); In re Petering, 301 F.2d 676, 133 USPQ 275 (CCPA 1962).

Kawai does not teach the details of the pleated filter such as fabric support as in claim 57. Kawai (680) teaches a porous support for the membrane (col 7 lines 57-68) but does not say that it is a fabric. EP'432 teaches a perfluorinated thermoplastic polymer support for the perfluorinated thermoplastic membrane to make a pleated membrane cartridge.(16-fig 1 and 2). It would be obvious to one of ordinary skill in the art at the time of invention to use the teachings of EP'432 and provide a fabric support for the membrane of Kawai (680) by lamination, because Kawai does not provide any details and also for improved strength and for providing an additional filter layer for coarse filtration.

Allowable Subject Matter

Claims 38 and 40(depending from 38) would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 1st and 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The closest prior arts are Kawai, Muto, Ashelin and EP-432. None of these references teach the "membrane" as a "depth filter formed of one or more wound fibers". References such as Degan (US 5,290,446) teach helically wrapped string wound depth filters made of, among many other materials, perfluorinated thermoplastics, but does not teach the housing, end caps and the sealing means also of such thermoplastics.

Response to Arguments

In response to the only argument about the Kawai ref: Kawai teaches not only PTFE, but also PFA and FEP in col 3 lines 42-53.

"The PTFE resin used in the invention is a tetrafluoroethylene homopolymer or a copolymer which contains not less than 50 mol%, preferably not less than 60 mol% and more preferably not less than 80 mol% of tetrafluoroethylene in terms of monomer unit, e.g., ***a tetrafluoroethylene-perfluoroalkylvinylether copolymer, a tetrafluoroethylene-hexafluoropropylene copolymer***, a tetrafluoroethylene-ethylene copolymer and so forth, or their mixture (emphasis added)."

Kawai also claims the same – see claim 3

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Krishnan S. Menon
Patent Examiner
6/9/05